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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/019,903	05/13/2002	Robert Burch	JMYT-253US	9993

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EXAMINER	
ALEJANDRO, RAYMOND	

ART UNIT	PAPER NUMBER
1745	6

DATE MAILED: 10/20/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/019,903	BURCH ET AL.
	Examiner	Art Unit
	Raymond Alejandro	1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 May 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 May 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *2* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d).

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 12/21/01 (paper # 2) was considered by the examiner.

Drawings

3. The sheets of drawings filed on 05/13/02 have been accepted.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claims 1-2 recite the limitation "a reforming catalyst" (four occurrences on each claim). There is insufficient antecedent basis for this limitation in the claim. It is unclear whether the claims intend to recite the same reforming catalyst. Appropriate clarification is required.

7. Claims 1-2 recite the limitation "the hydrogen concentration" in lines 16 and 1 (page 9). There is insufficient antecedent basis for this limitation in the claim.

8. The language "in dry reformate above 25 %" in claims 1-2 is of uncertain meaning, thereby rendering the claims indefinite. Further, the language " in dry reformate above 25 %" is not defined by the claim, and the specification does not provide a standard for ascertaining the requisite degree. It is uncertain as to what is meant by the term "in dry reformate above 25 %", for example, whether the claims intend to recite the specific load capacity, hydrogen production, or hydrogen concentration.

9. Claim 7 recites the limitation "the catalyst bed temperature" in line 15. There is insufficient antecedent basis for this limitation in the claim.

10. Claim 8 recites the limitation "the reactant feeds" in line 19. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

12. Claims 1-4 and 7-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Cimini et al 5624964.

The present application is directed to a method for regenerating a catalytic fuel processor wherein the disclosed inventive concept comprises the continuous step of passing fuel, air and

steam. Other limitations include the addition of water, air and oxygenate; the catalyst bed temperature and the reactant feed.

As to claims 1-4 and 7-8:

Cimini et al disclose the following (ABSTRACT/ CLAIM 1):

[57] **ABSTRACT**

A process for integration of a steam reforming unit and a cogeneration power plant in which said steam reforming unit comprises two communicating fluid beds; the first fluid bed comprising a reformer containing catalyst and which is used to react steam and light hydrocarbons at conditions sufficient to produce a mixture comprising synthesis gas hydrogen, carbon monoxide, and carbon dioxide, the second fluid bed comprising a combustor-regenerator which receives spent catalyst from the first fluid bed and which provides heat to heat the catalyst and balance the reaction endotherm. by combusting fuel gas in direct contact with the catalyst producing hot flue gas; said cogeneration power plant comprises a gas turbine equipped with an air compressor and a combustor; said integration which comprises drawing off a portion of compressed air from the power plant gas turbine air compressor leaving remainder compressed air; introducing the drawn off compressed air to the combustor-regenerator; mixing the hot flue gas from the combustor-regenerator with the remainder of the compressed air to produce a recombined gas stream and feeding this recombined gas stream to the combustor of the cogeneration gas turbine power plant.

Cimini et al further disclose that in the fluidized bed the catalyst is continuously regenerated in the regenerator (COL 4, lines 35-38). *Since the catalyst is continuously regenerated during the hydrogen production step, it is then noted that the percentage of hydrogen production/concentration is substantially equivalent to percentage of hydrogen production/concentration under full load operations.*

35 operations. In the fluidized bed, the need to maintain low single pass coke production is reduced since the catalyst is continuously regenerated in the regenerator.

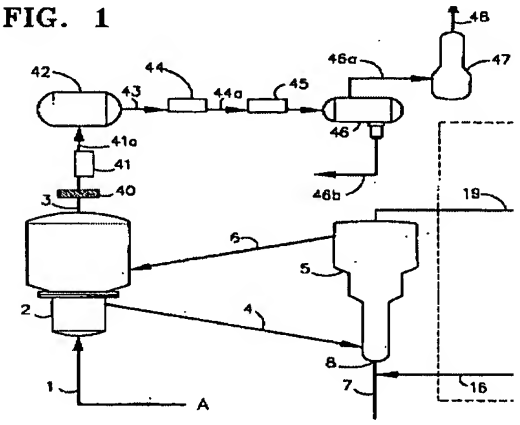
Figure 1 below shows a flow-sheet of the steam reforming process unit, in particular, it is disclosed that a pressurized feedstream for steam reforming containing steam and methane at a specific ratio is introduced through line 1 into the reformer reactor 2 which is a fixed fluid bed;

the reformer reactor 2 contains a bed of fluidized catalyst (COL 4, line 60 to COL 5, line 10). Product effluent H2 exits the reforming reactor through line 3. Spent catalyst from the reformer reactor 2 is passed through conduit 4 to the combustor generator generally operating at a temperature higher than the reformer with a heat differential supplied by the burning in the regenerator of light hydrocarbons such as fuel gas and coke, in this case, methane is the fuel (COL 5, lines 14-27).

In combustor-regenerator 5, a fuel stream comprising fuel mixed with air is introduced therein through lines 7 and 16 and the fuel is burned in the combustor regenerator to generate heat. The catalyst is heated in the combustor regenerator to a higher temperature. The regenerated catalyst passes out of the combustor regenerator 5 through conduit 6 and is conveyed back to the reforming reactor 2 (COL 5, lines 44-57).

Thus, the steam reforming process of Cimini et al encompasses the regeneration/reactivation of the reformer catalyst comprising the step of continuing to pass fuel, air and steam through the reformer catalyst while the catalyst is heated by an external heat source and the reactant stream i.e. the fuel, the air and the steam are controlled.

FIG. 1



Thus, the claims are anticipated.

13. Claims 1-5 and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Autenrieth et al 6432378.

With respect to claims 1-5 and 8:

Autenrieth et al disclose a process for operating a methanol reforming system (TITLE) wherein the process includes, in the reforming reaction operation, feeding methanol and the catalyst reactivation. The catalyst reactivation phases includes the treatment of the catalyst in an activity-regenerating manner (CLAIMS 1-3 and 6-7/ABSTRACT).

> 1. A process for operating a methanol reforming system, comprising:
>
> alternately operating said system in a normal water vapor reforming reaction mode and a catalyst reactivation mode, wherein
>
> during said normal water vapor reforming reaction mode, methanol is catalytically reformed in a reactor containing a catalyst whose catalytic activity decreases during said water vapor reforming; and
>
> during said catalytic reactivation mode, said catalyst is subjected one or more times to a reactivating treatment to restore at least partially the activity of the catalyst,
>
> wherein said reactivating treatment consists of increasing a temperature of the reactor and reducing a load of the reactor as compared to its load in the normal water vapor methanol reforming mode while maintaining a catalytic reforming reaction in the catalyst reactivation mode with said reduced load and increased temperature.
>
> 2. The process according to claim 1, wherein said reduced load is greater than 0% to about 50% of a maximum possible load.
>
> 3. The process according to claim 1, wherein said increased temperature is about 10° C. to 50° C. higher than the temperature of said catalytically reforming.

6. A process according to claim 1, wherein said catalyst reactivation mode does not disturb a current driving operation of a vehicle comprising said methanol reforming system.

7. A process for operating a methanol reforming system, consisting of:

alternately operating said system in a water vapor reforming reaction mode and a catalyst reactivation mode, wherein

during said water vapor reforming reaction mode, methanol is catalytically reformed in a reactor containing a catalyst whose catalytic activity decreases during said water vapor reforming; and

during said catalytic reactivation mode, said catalyst is subjected one or more times to a reactivating treatment to restore at least partially the activity of the catalyst,

wherein said reactivating treatment consists of increasing a temperature of the reactor and reducing a load of the reactor as compared to its load in the normal water vapor methanol reforming mode while maintaining a catalytic reforming reaction in the catalyst reactivation mode with said reduced load and increased temperature.

It is disclosed that the reactivation phases can be integrated in the normal driving operation when the system is used in motor vehicles (COL 2, lines 47-50). It is also disclosed that it is possible to integrate the catalyst reactivation phases in the normal driving operation without the requirement of interrupting the driving operation of the vehicle (COL 3, lines 5-13/COL 4, lines 61-65). *Thus, the reformer supplies hydrogen while the catalyst is also regenerated.* Hydrogen generation occurs in the water vapor reforming system (COL 3, lines 15-21). It is also disclosed that that temperature is increased (COL 2, lines 51-55).

It is disclosed that a first method comprises operating the reforming system during the catalyst reactivation phases at a partial load of approximately 50 % of maximally possible load (COL 3, lines 51-58). It is disclosed that the temperature in the reactor and therefore of the catalyst material is raised (COL 3, lines 60-65). It is also disclosed that an increased air lambda

value during catalyst reactivation phases is selected and therefore results in the setting of an increased oxygen excess (COL 4, lines 20-30). *It is also noted that methanol is an oxygenate.*

Thus, the claims are anticipated.

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

15. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

16. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cimini et al 5624964 as applied to claims 1-2 above, and further in view of Supp et al 5310506.

Cimini et al is applied, argued and incorporated herein for the reasons above. However, Cimini et al do not disclose the specific oxygenate added to the feed.

Supp et al teaches a reforming reactor wherein high-hydrogen exhaust gas MTBE (methyl tert butyl ether) is supplied at least in part to the reforming reactor (COL 2, lines 1-18).

Thus, it would have been obvious to one skilled in the art at the time the invention was made to add the specific oxygenate of Supp et al to the reformer reactor of Cimini et al as Supp et al teach that methyl tert butyl ether can be supplied to the reforming reactor because it (the methyl tert butyl ether) is a high hydrogen gas and its processing involves particularly low cost for producing hydrogen. Thus, the methyl tert butyl ether is a suitable compound use to generate hydrogen in reforming reaction environments.

17. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Autenrieth et al 6432378 as applied to claim 5 above, and further in view of Supp et al 5310506.

Autenrieth et al is applied, argued and incorporated herein for the reasons above. However, Autenrieth et al do not disclose the specific oxygenate added to the feed.

Supp et al teaches a reforming reactor wherein high-hydrogen exhaust gas MTBE (methyl tert butyl ether) is supplied at least in part to the reforming reactor (COL 2, lines 1-18).

Thus, it would have been obvious to one skilled in the art at the time the invention was made to add the specific oxygenate of Supp et al to the reformer reactor of Autenrieth et al as Supp et al teach that methyl tert butyl ether can be supplied to the reforming reactor because it (the methyl tert butyl ether) is a high hydrogen gas and its processing involves particularly low cost for producing hydrogen. Thus, the methyl tert butyl ether is a suitable compound use to generate hydrogen in reforming reaction environments.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (703) 306-3326. The examiner can normally be reached on Monday-Thursday (8:30 am - 7:00 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (703) 308-2383. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Raymond Alejandro
Examiner
Art Unit 1745